

# **BNL EMCA UPDATE**

**12/6/2016**

# To Do:

## Blocks:

- Measure dims/density
- Image ends
- Measure uniformity (on pmt)
- Drill holes for support stud
- Attach (epoxy) light guides
  - measure LO uniformity
- Attach (epoxy) reflectors
- Attach/couple (rtv & screws) sipm pcb
  - Test – cosmics
- Replacements?

## Electronics:

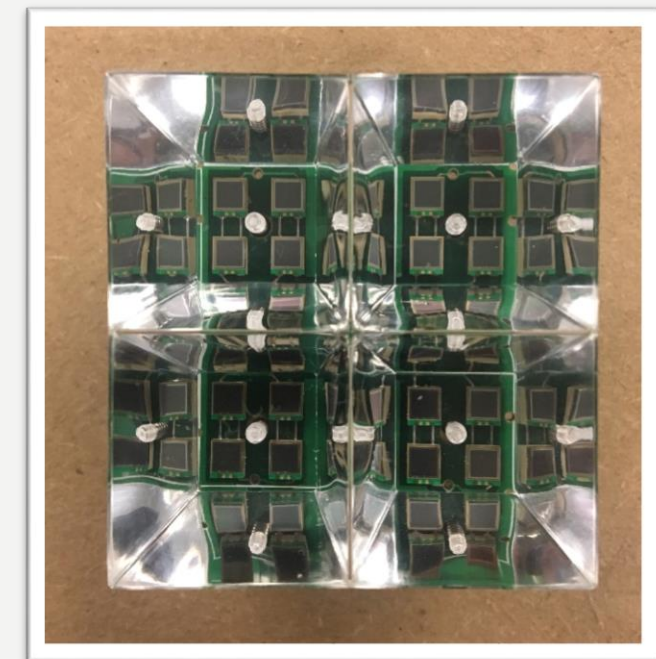
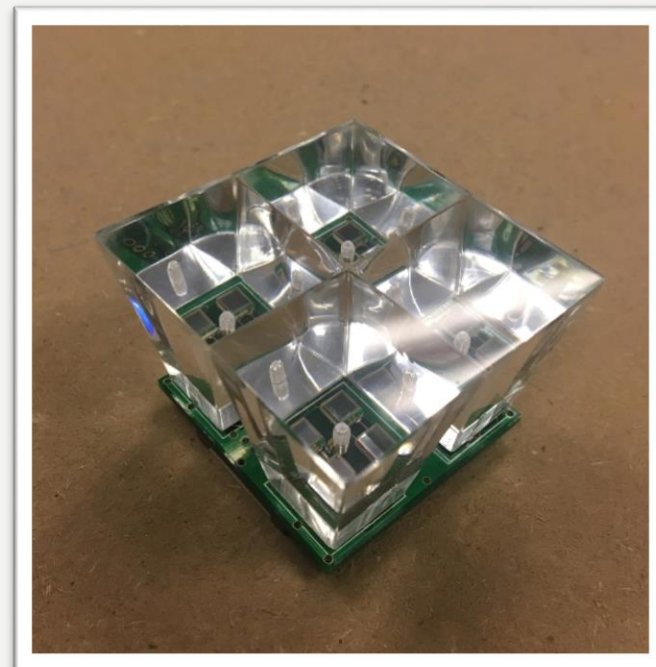
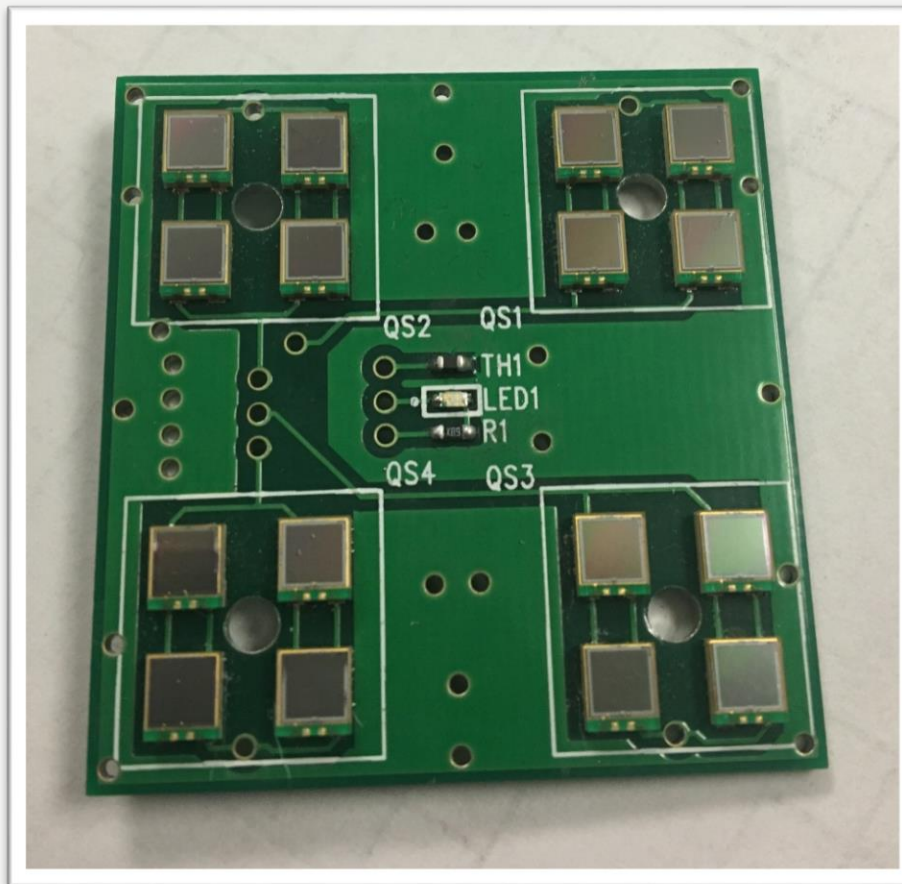
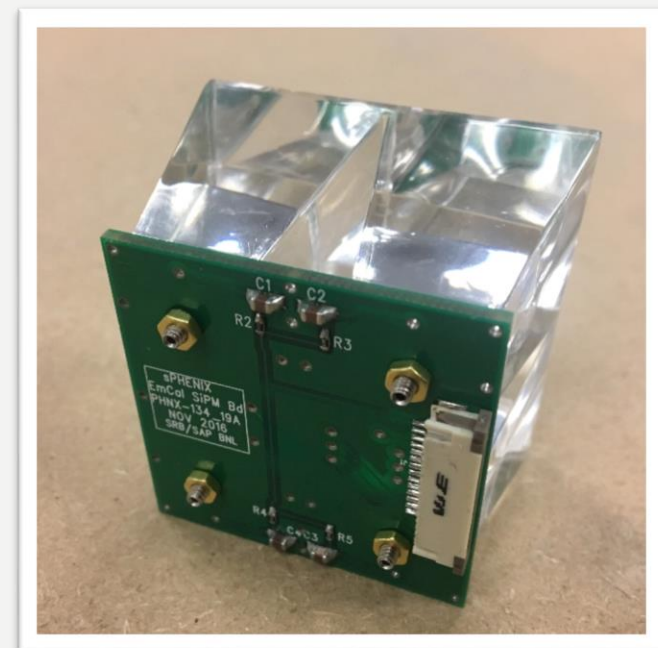
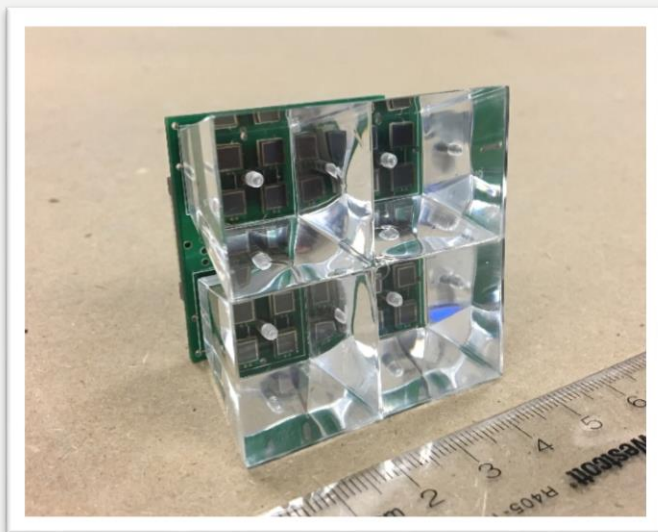
- Put sipms onto pcbs
  - check uniformity
- Test preamp board
- Cables (inside and outside of housing)
- LEDs

## Frame/Housing

- Modify per 11/22 mtg (move post, add positioning plane, add mech support for load, markings for positioning)
- Backplane
- Cable connections
- Movements - rotation
- Assemble
- Install blocks(w/LG & pcb)
- Air cooling manifolds/connections
- Lift points/hardware

## Assembled Detector

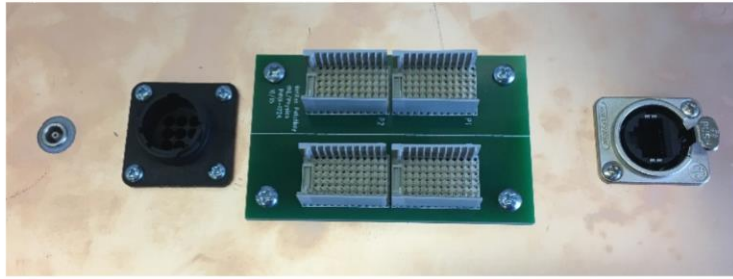
- Gain balancing
- Temperature stability
- Burn in
- Cosmics data



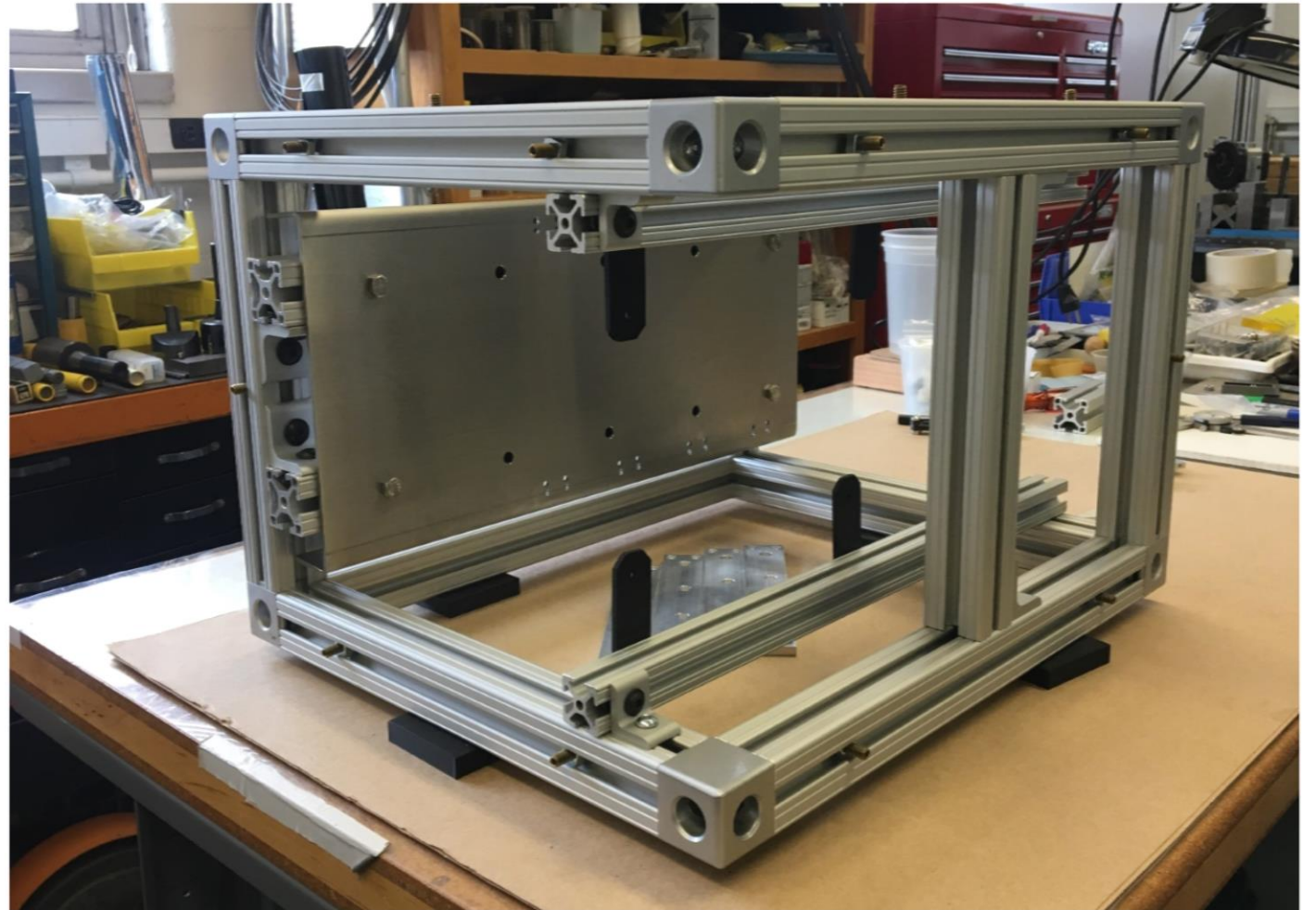
EMCal "daughterboard" PCB w/sipms  
And quad injection molded light guide



connections



Block mounting hardware



Modified frame



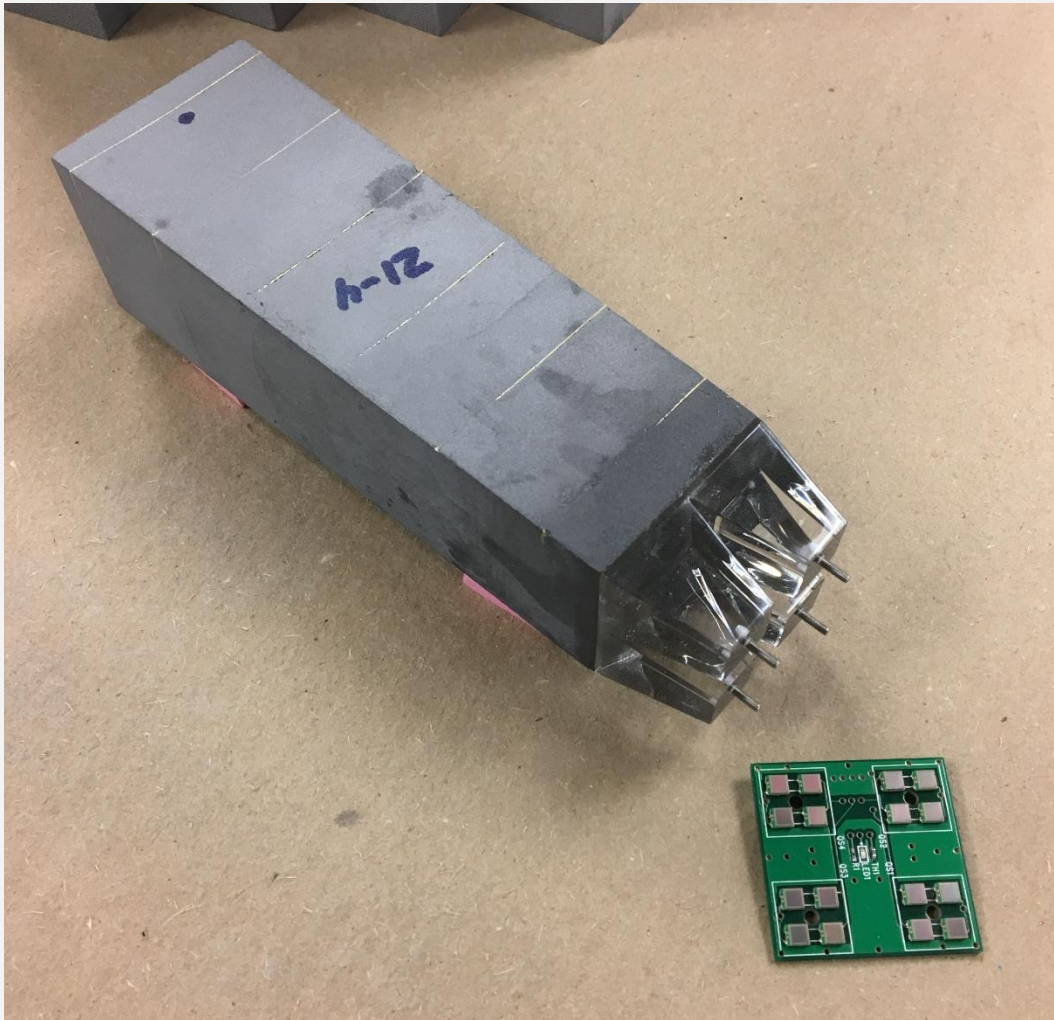
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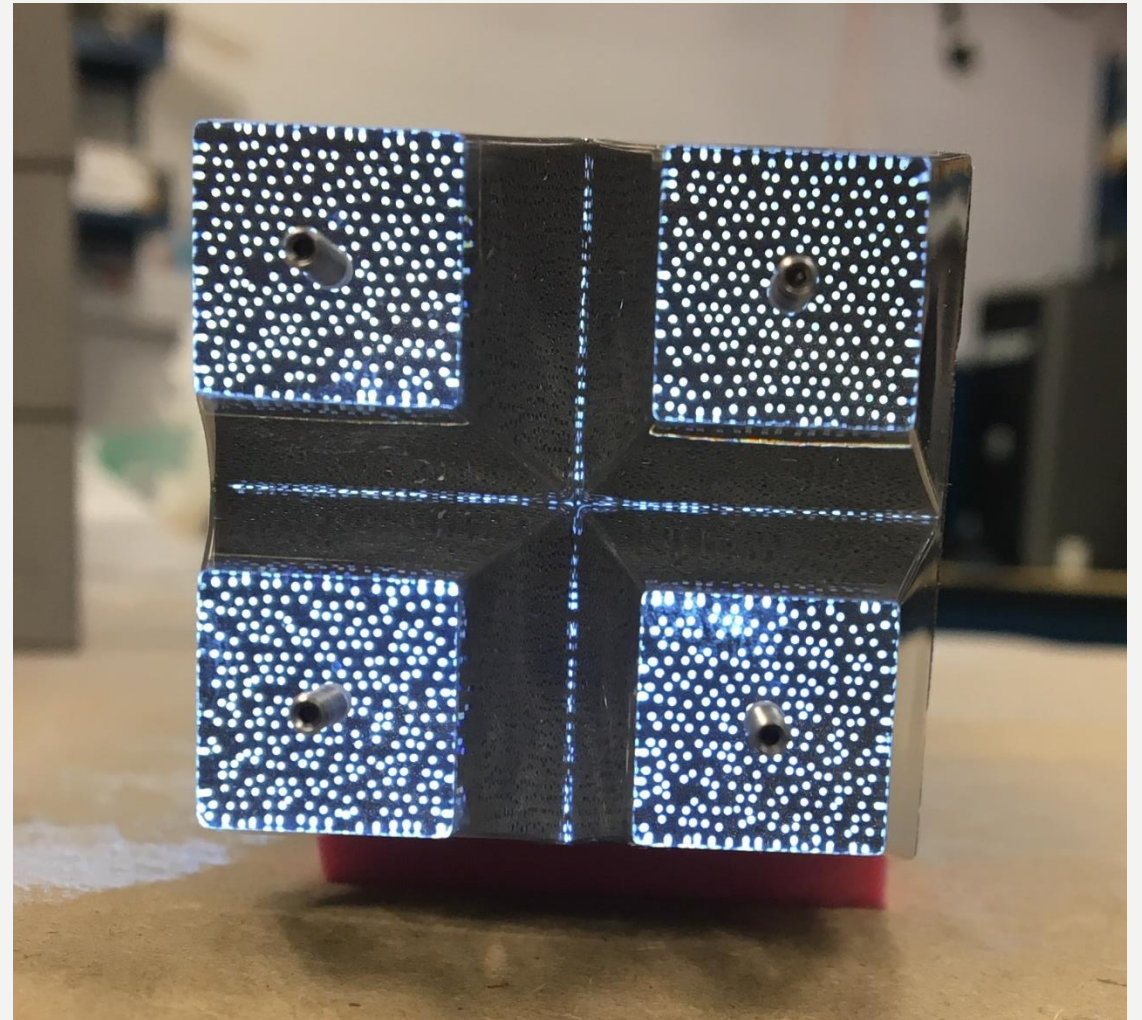
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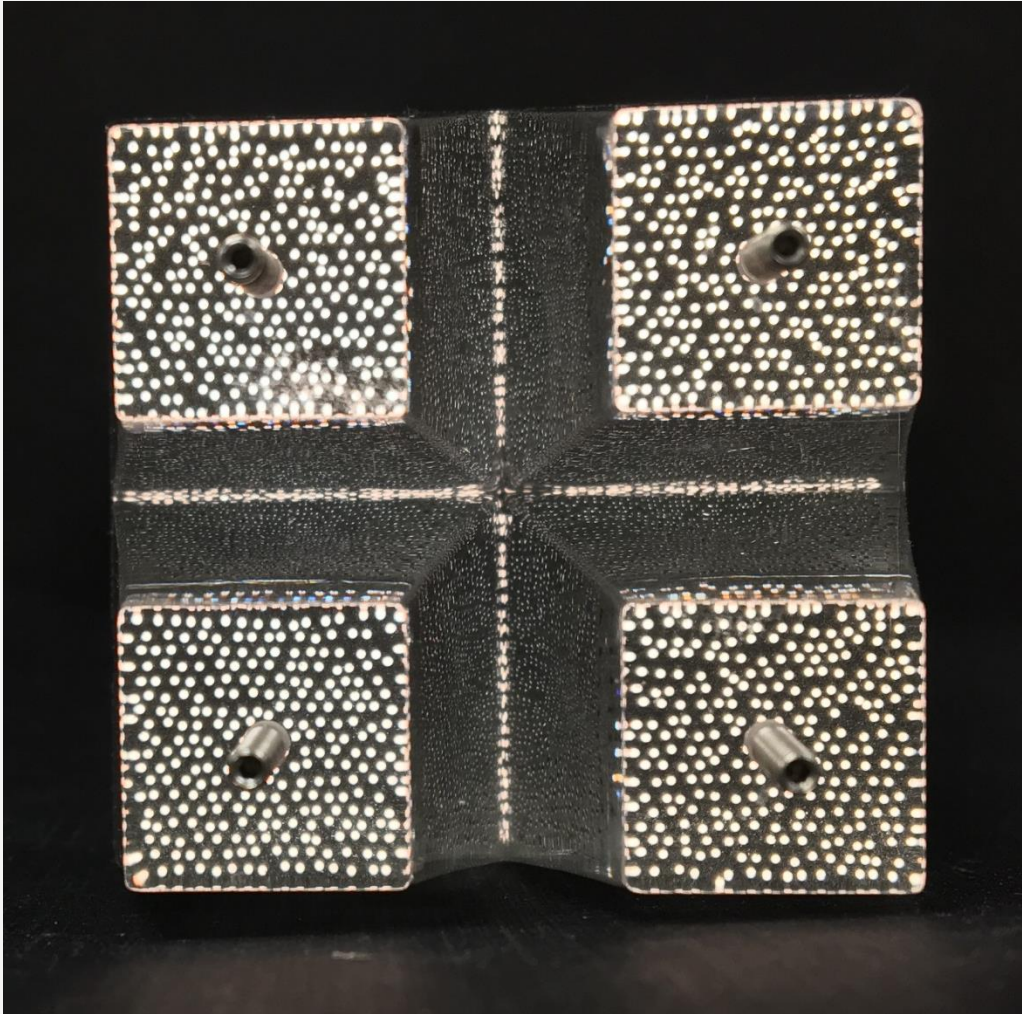


Block 21-4 w/ attached LG and daughterboard

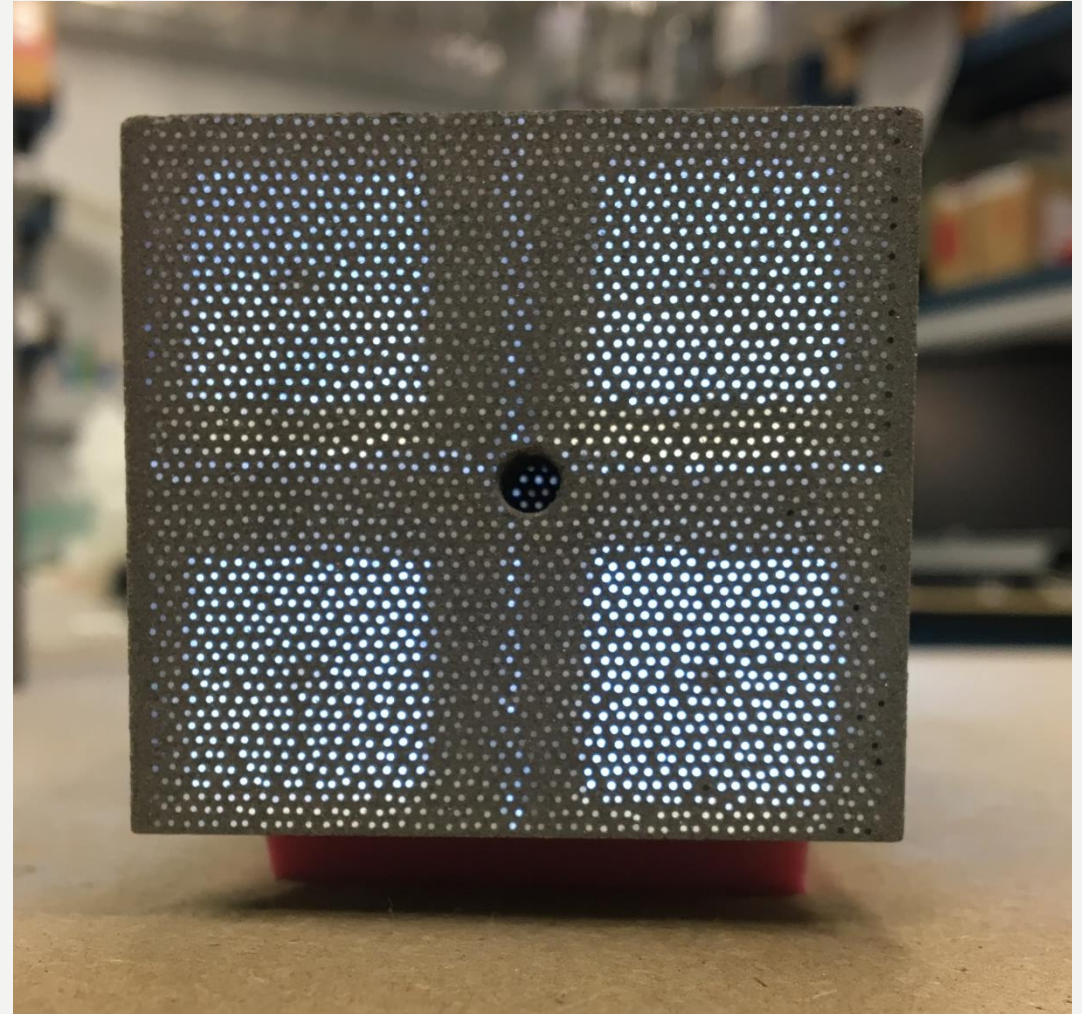


Sipm view of backlit block





Block + LG: – lit from back, viewed from front.....

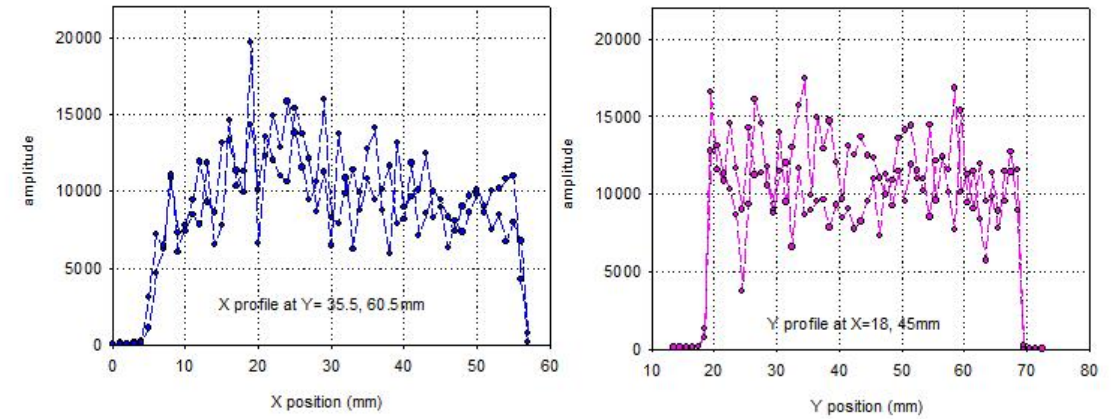
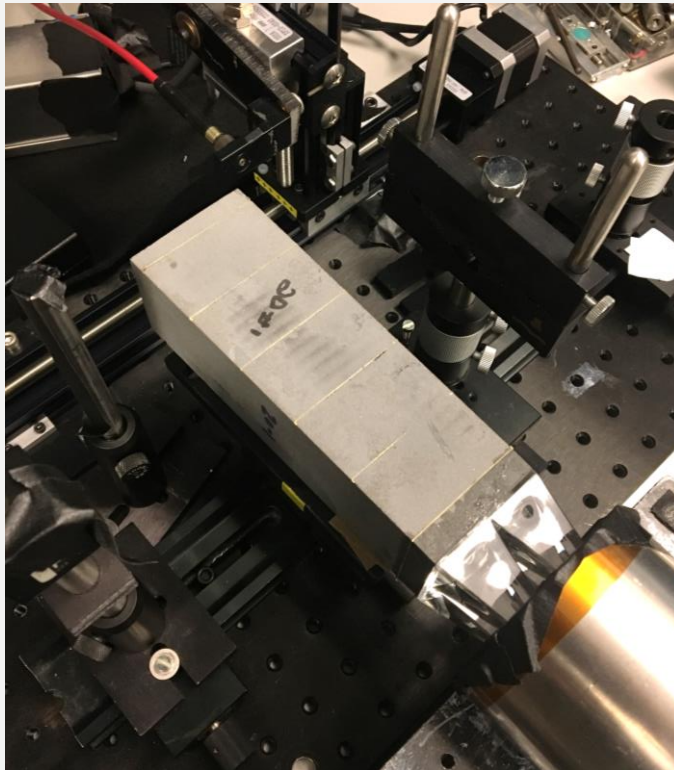


and lit through light guide, viewed from back

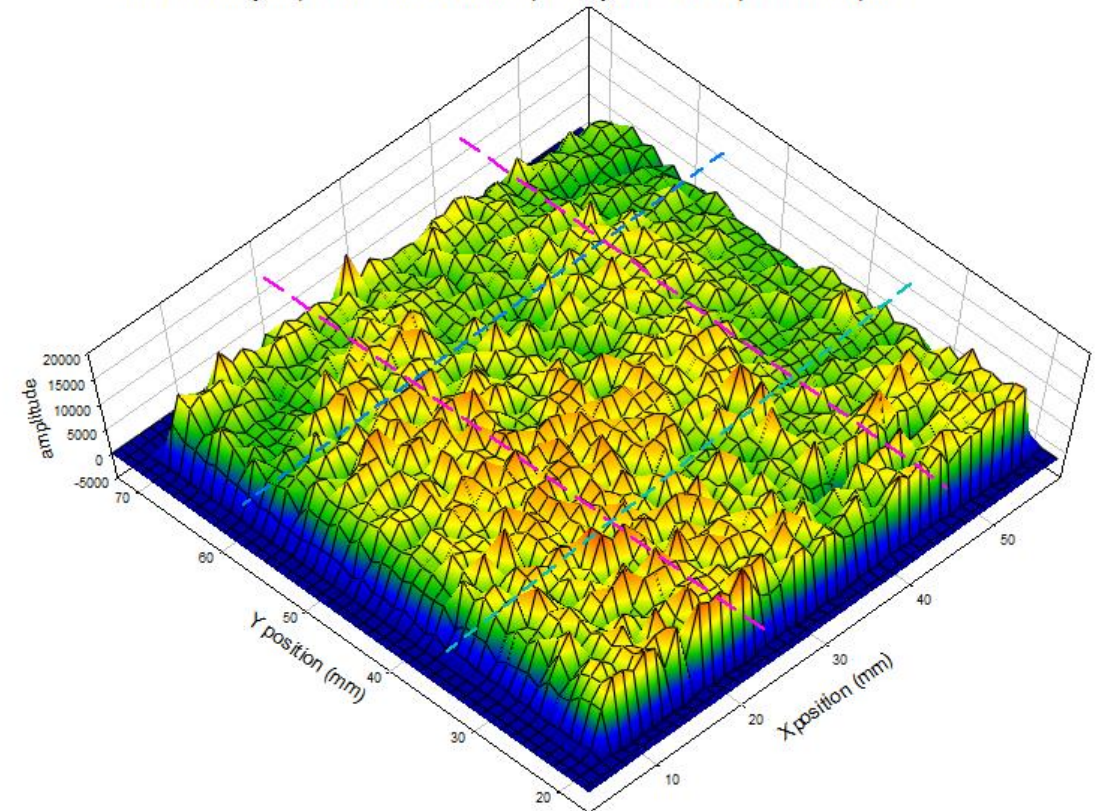


## Uniformity scan of block 20-1

- quad 1" injection molded acrylic light guides
- coupled to 7cm pmt
- Open end (no reflector) scanned with 360nm LED through 0.6mm diam quartz fiber
- 1mm steps
- Fiber spaced 1mm from block end



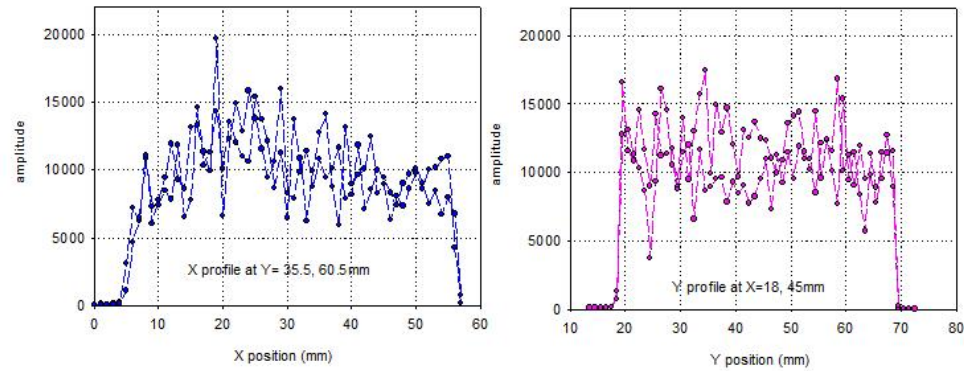
dec01 uniformity map of block 20-1 w/ molded quad acrylic LG on 7cm pmt. RTV coupled



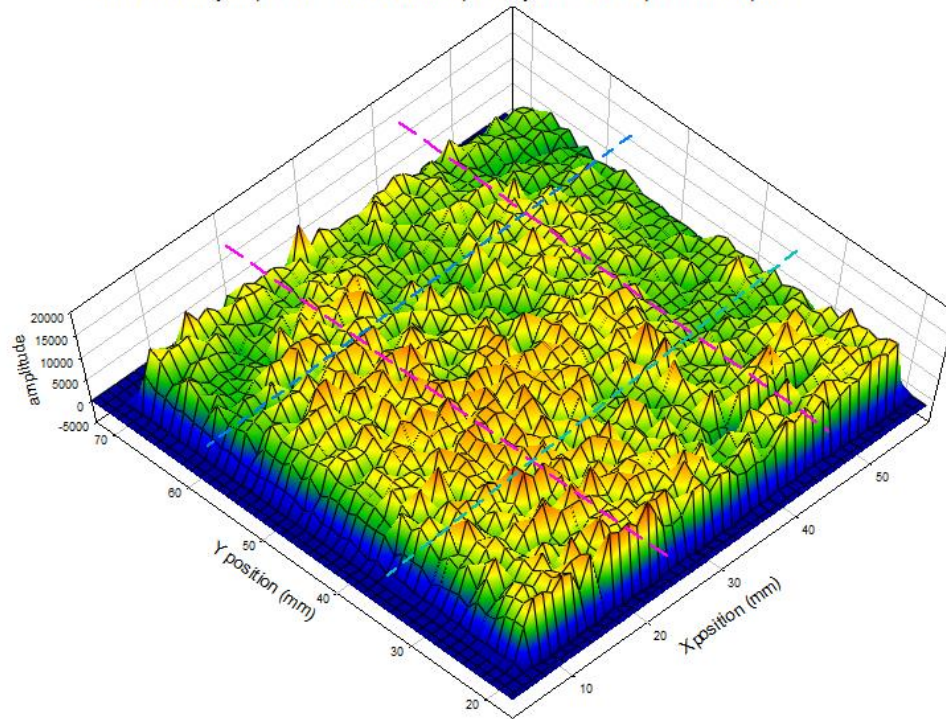


# X-Y Scan of Block 20-I w/ quad LG , coupled to pmt

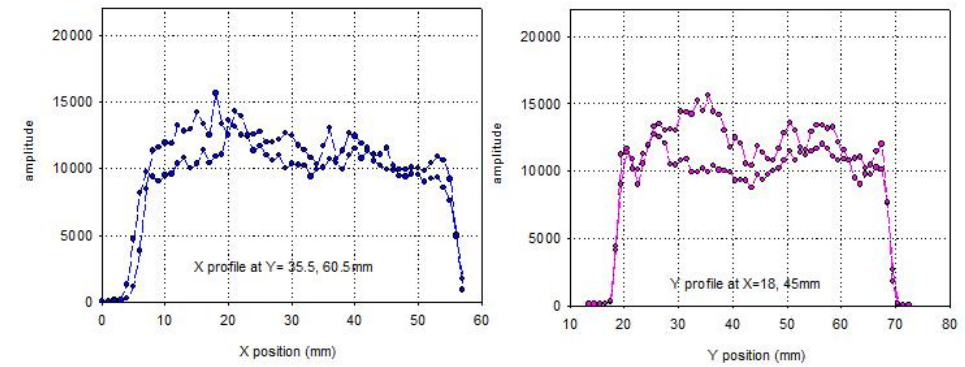
## LED Fiber 1mm from block end



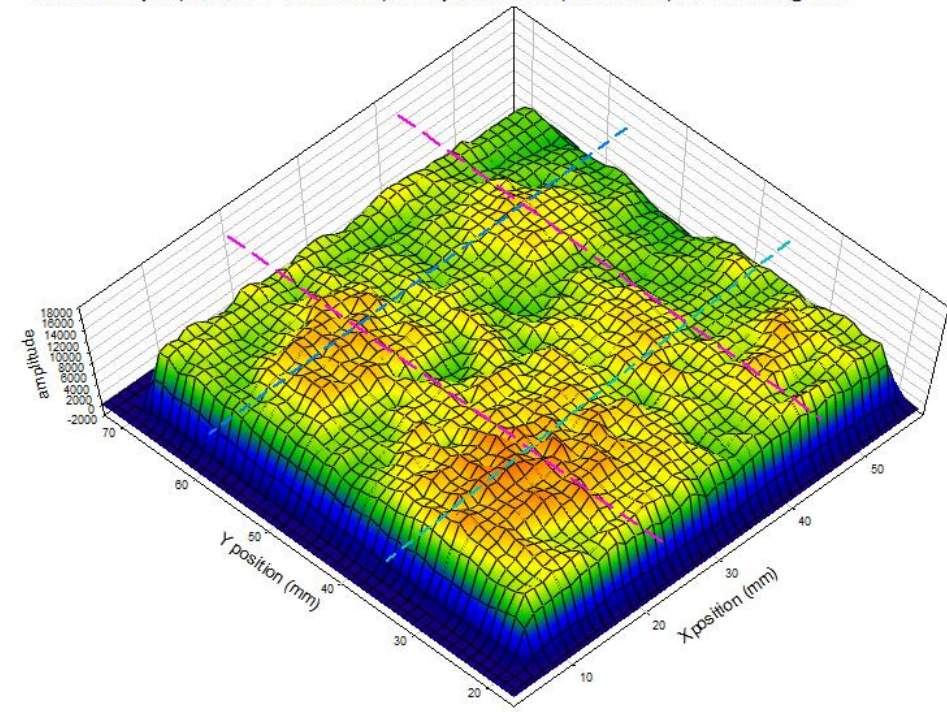
dec01 uniformity map of block 20-1 w/ molded quad acrylic LG on 7cm pmt. RTV coupled



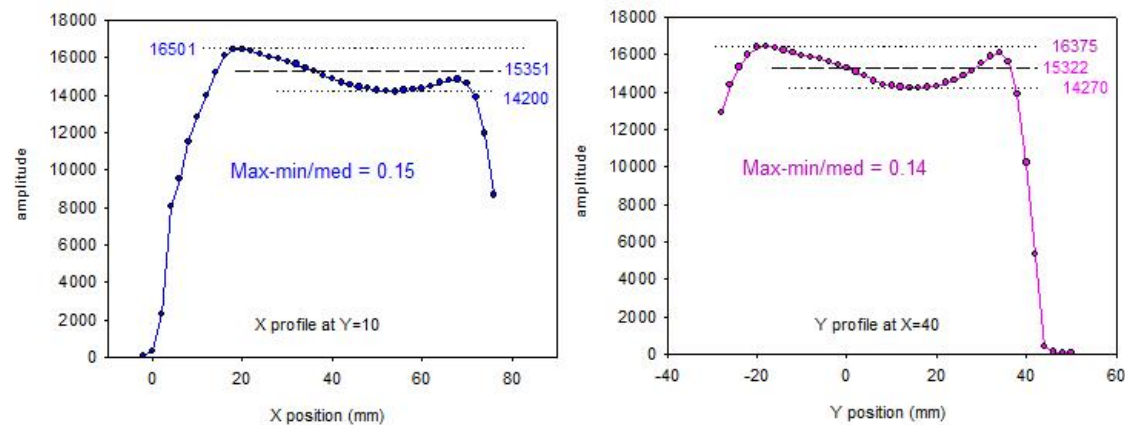
## LED Fiber 5mm from block end



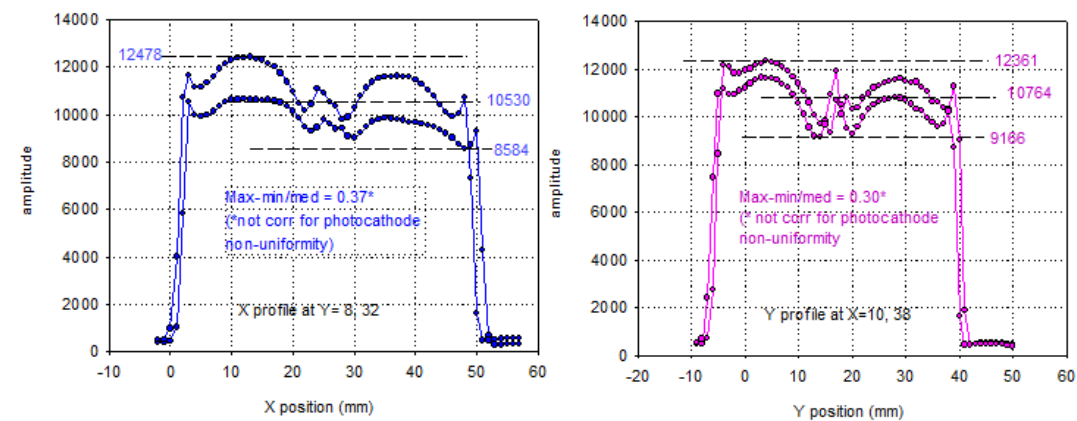
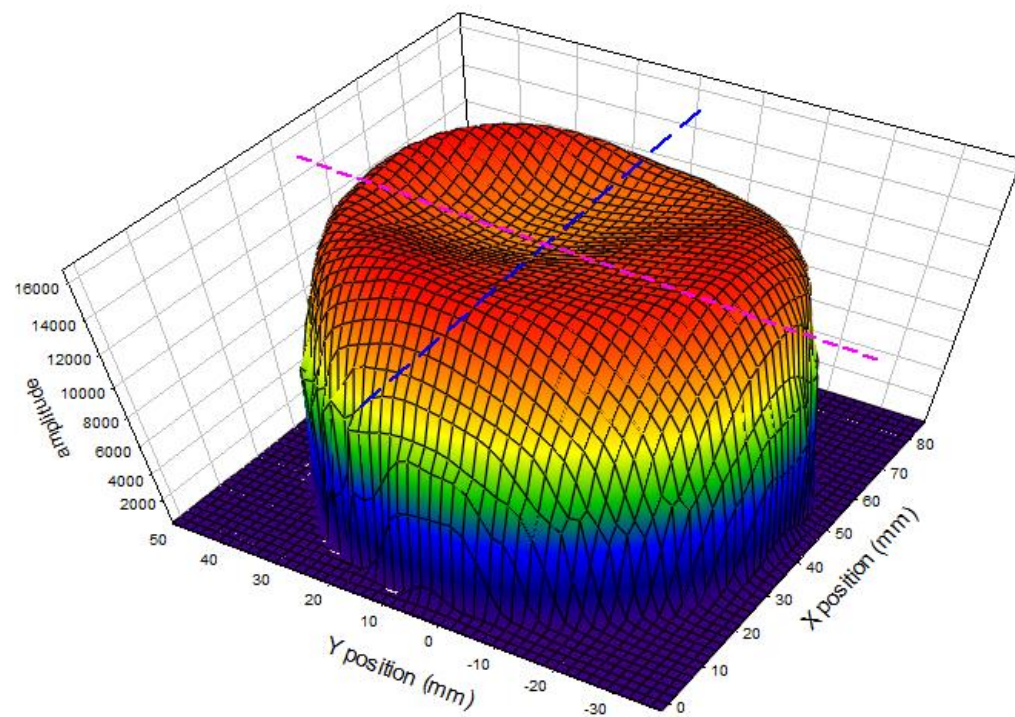
dec05 uniformity map of block 20-1 w/ molded quad acrylic LG on 7cm pmt. RTV coupled. LED fiber @ 5mm



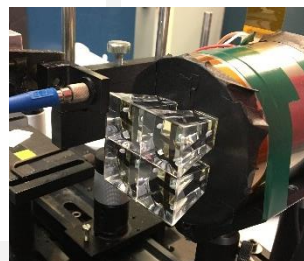
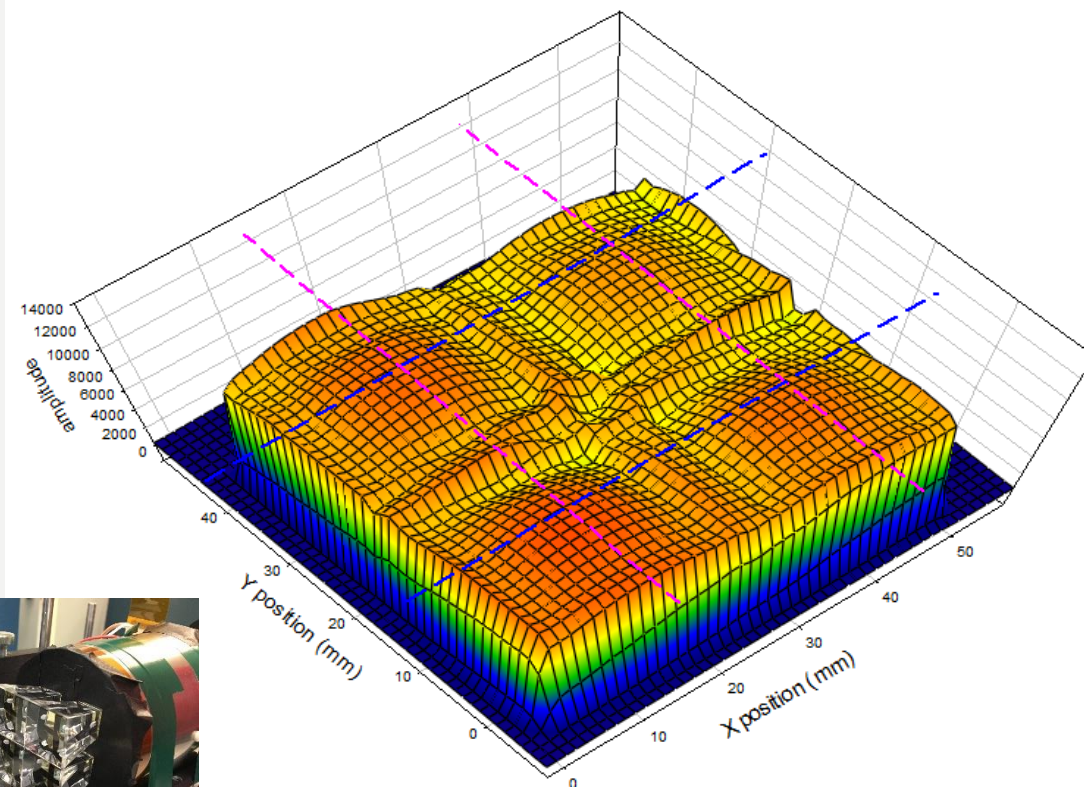




nov21 uniformity map of Aerogel pmt (70mm diam) photocathode



nov23 uniformity map of molded quad acrylic LG on Aerogel pmt photocathode



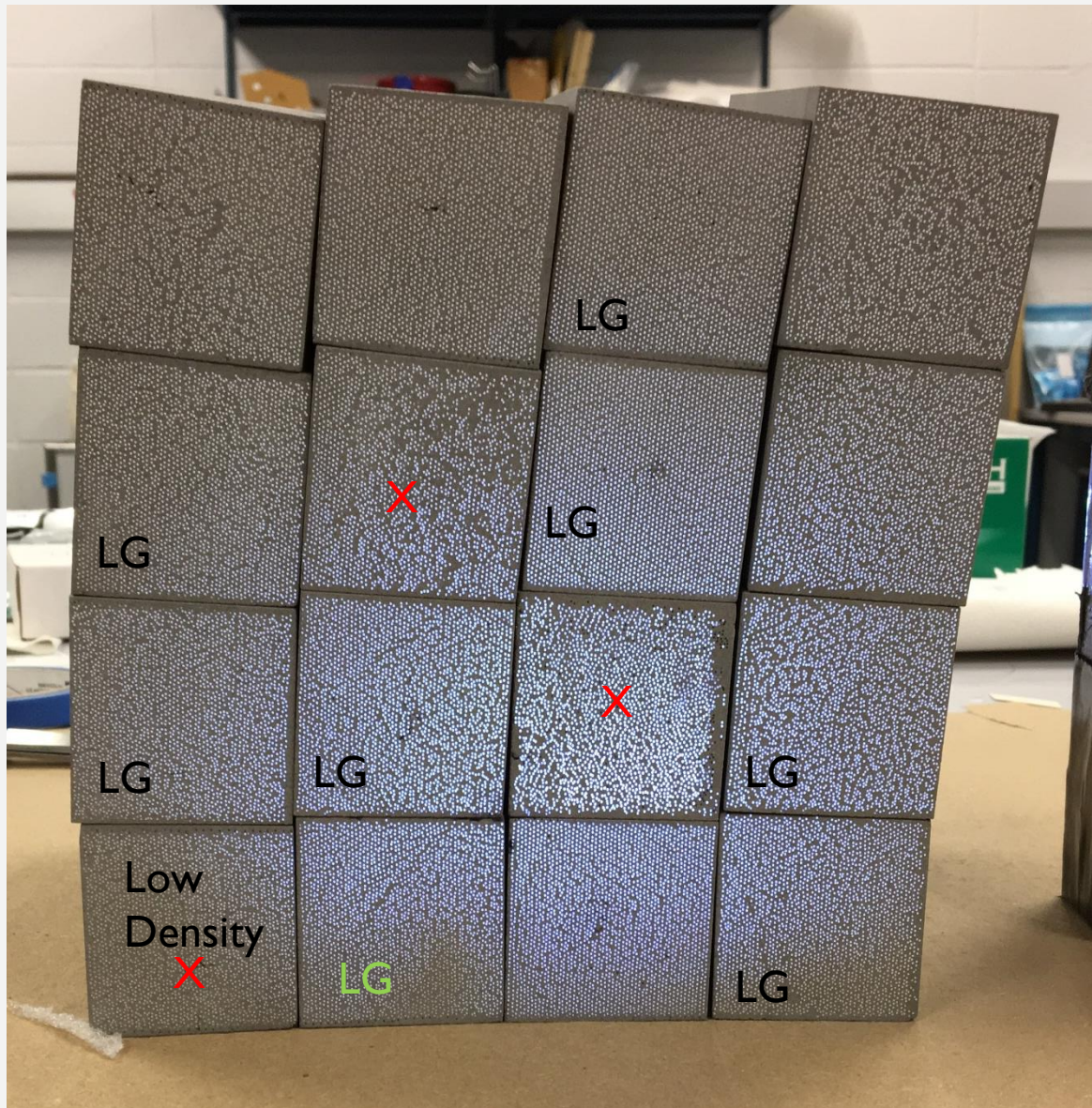


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Candidates for replacement:

20-3

21-2

22-4 (lowest density: 9.56 g/cc)